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IS 14487 (1997): Measurement of Area of Leather - Guideline
[CHD 17: Leather, Tanning Materials and Allied Products]

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भारतीय मानक

चमड़े का क्षेत्र मापन — मार्ग निर्देशिका

Indian Standard

MEASUREMENT OF AREA OF LEATHER — GUIDELINE

ICS 59.140.30

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 1997 **Price Group 2**

Leather Sectional Committee, CHD 017

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Leather Sectional Committee had been approved by the Chemical Division Council.

Measurement of area of leather through pin-wheel measuring machine is often a matter of dispute in the leather industry. The Committee therefore felt the need for a guideline to measure the area of leather.

This standard has been prepared, based on ISO 11646 'Leather — Measurement of area' and the method prescribed by the Physical Test Commission of the International Union of Leather Technologists and Chemists Societies (IUP Commission, IULTCS) IULTCS/IUP 32. This standard is therefore technically equivalent with ISO 11646. Indian Standards on atmospheric conditions have been stipulated in this standard in place of the atmospheric conditions stipulated in ISO 11646 for the conditioning of the test pieces.

Composition of the committee responsible for formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

MEASUREMENT OF AREA OF LEATHER — GUIDELINE

1 SCOPE

This standard prescribes a method of measuring the area of pieces of leather. It is intended only for the measurement of dressed and other dry flexible leathers with the help of a pin-wheel machine.

2 REFERENCE

The Indian Standard listed below contains provisions which through reference in this text, constitute provision of this Indian Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this Indian Standard are encouraged to investigate the possibility of applying the most recent edition of the Indian Standard indicated below:

IS No.	*Title*
5914 : 1970	Methods of physical testing of leather

3 PRINCIPLE

The area of the conditioned leather is measured with a mechanical pin-wheel machine.

4 APPARATUS

4.1 Mechanical Pin-Wheel Area—Measurement Machine

The machine used should preferably have a feed-roller speed of 20 ± 2 m/min. The distance between the centres of the pins on two adjacent pin wheels should preferably be 25.4 ± 2.5 mm, when measured parallel to the axis of the pin-wheel roller. Pin-wheel machines which do not conform to these recommendations may also be used, but the actual design values shall be stated in the test report.

4.2 Circular Calibration Templet

The templet shall be made of flexible reinforced material, for calibrating the pin-wheel machine immediately before the machine is used. The area of the templet shall not be less than 5 percent of the pin-wheel machine capacity, and the width of the templet shall not be greater than 50 percent of the machine's working width.

The area of the templet shall, if possible, be within ± 50 percent of the anticipated area of the piece of leather to be measured. If this is not possible, feed the same templet through the machine a number of times (N) without resetting the machine to zero until the total reading is within ± 50 percent of the anticipated test-specimen area and this total is treated as a single measurement.

When not in use, the templet(s) shall be kept flat in the standard atmosphere defined in LP 0 of IS 5914.

The area of the templet(s) shall be verified at least once a year by an independent body using measurement instruments traceable to the national standard calibration procedure. The templet is acceptable if its measured area is within ± 0.5 percent of its nominal area.

NOTE — Users of this standard are recommended to keep a record book of the measurements obtained during the daily calibration procedure. It should be inspected at regular intervals to detect any consistent trends towards inaccurate readings, for example, left side of the machine always reads low, right side tends to read high. This gives advance warning of faults, which can be of use to the maintenance engineer when servicing the machine.

4.3 Calibration Procedure

Before each series of test carry out the following procedure.

4.3.1 Switch on and run the machine for at least 2 min, then pass an 'old' (that is, uncertified) templet through the machine approximately 25 times in a random manner to ensure that all wheels are engaged. Some of the passes shall be cumulative, without resetting the machine to zero, in order to ensure that, all moving parts of the machine are running freely.

4.3.2 Set the zero of the machine and pass a certified templet through the machine N times without cancelling the individual readings. Ensure that all pin wheels which will be actuated by the subsequent pass of the leather test specimen have also been actuated by the templet. If the recorded total area is within ± 0.01 m^2 of the theoretical total area, proceed to the next stage. If it is beyond this range, adjust the machine and repeat the N passes until the recorded area is within the prescribed tolerance.

4.3.3 Once the machine measures to within the prescribed tolerance, zero the measurement gauge and repeat twice the procedure described in **4.3.2**. Record all three total areas to the nearest 0.01 m^2.

4.3.4 If all three total areas are higher or lower than N times the theoretical templet area, or if the difference between the maximum and minimum total area is greater than 0.02 m^2, repeat the calibration procedure from the beginning of **4.3.2** after making appropriate adjustments to the machine.

5 PROCEDURE

5.1 Conditioning of the Leather

5.1.1 Unless otherwise agreed (*see* **5.1.2**) expose the leather test specimen to the standard atmosphere defined in IS 5914 (27±2°C and 65±5 percent relative humidity) for at least 48 h.

5.1.2 For some purposes, it is unnecessary to subject test specimens to a strict conditioning procedure, and measurements may be carried out on leather which has not been conditioned, or has been conditioned in a way other than that specified in IS 5914. Whenever conditions other than those specified in **5.1.1** are used, the conditioning regime shall be stated in the test report as a deviation from the method.

NOTE — Generally relative humidity is more important than atmospheric temperature in determining the moisture content and surface area of pieces of leather. Leather which has a moisture content below that which would be obtained by conditioning in accordance with IS 5914 will have a lower measured area. Some leathers, for example chamois, exhibit considerable hysteresis in their regain of moisture from a standard atmosphere. For this reason, and to minimise disputes, it is recommended that in arbitration such leather is conditioned on the descending side of the hysteresis loop, that is, from a moisture content corresponding to a higher relative humidity down to 65 percent relative humidity.

5.1.3 Support the leather if possible along the backbone in such a way that air has free access to both surfaces, and keep the air in continuous motion by means of a suitably placed fan.

5.1.4 Note the time of conditioning in hours.

5.2 Start of Measurement

Carry out the test either in the same atmosphere as used for conditioning or in ambient conditions but within 30 min of removing the test specimen from the conditioning atmosphere. Before each measurement, set the pointer of the measurement gauge to zero.

5.3 Method of Measurement

Feed the test specimen into the machine with the higher friction surface in contact with the pin-wheels. The specimen shall be absolutely flat and without creases at the moment when it passes between the pin-wheels and the top of the feed-roller. In the case of soft leathers, this smoothing may involve pulling the +hide from edge to edge with sufficient force to prevent the pins pushing the leather into the transport feed-roller slots, the specimen being held in such a manner that it remains flat as it passes through the machine. To ensure this, more than one operator may be needed to feed the specimen into the machine.

5.4 If the specimen has a linear or nearly linear edge, for example, along the sides, it shall be fed through the machine so that the straight edge forms an angle of about 30° to the direction of movement. In any other case, the line of the backbone shall be perpendicular, or almost so, to the axis of the rollers.

5.5 If the area of the test specimen is more than 5 percent of the measurement-machine capacity, measure the area twice. If the readings differ, repeat the minimum number of times required to obtain two equal readings after rounding to the nearest 0.01 m^2. If the pointer is exactly in the middle between two scale divisions, round the reading up to the higher of the two divisions.

5.6 If the area of the test specimen is less than 5 percent of the measurement-machine capacity, feed the specimen through the machine repeatedly without zeroing in between until the total measured area exceeds 5 percent of the measurement-machine capacity. Repeat the sequence of measurements to obtain a second reading. If the first reading differs from the second after rounding to the nearest 0.01 m^2, repeat the sequence to the minimum number of times required to obtain two equal readings. Calculate the area of the specimen as the total measured area divided by the number of times the specimen was fed through the machine and then round to the nearest 0.01 m^2.

6 EXPRESSION OF RESULTS

Report the area of the test specimen as the average of two valid measurements in m^2, rounded to two places of decimals.

7 TEST REPORT

The test report shall included the following information:

a) A description of type of leather tested;
b) A reference to this standard;
c) The time of conditioning in hours;
d) The result of the area measurement in m^2, rounded to 2 places of decimals; and
e) Details of any deviations from the procedure.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

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Shri P. Mukhopadhyay
Joint Director (Chem), BIS

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